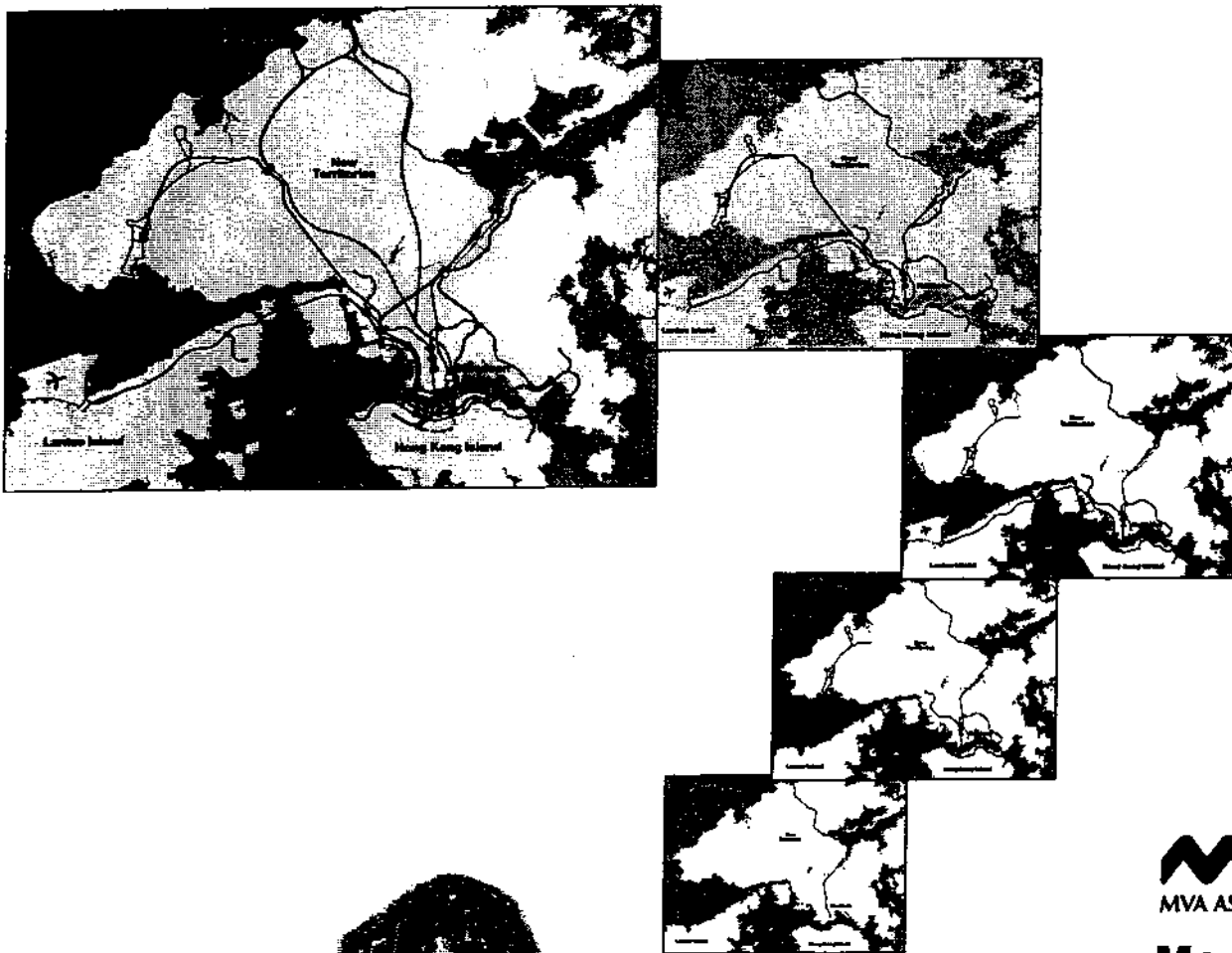


The Urban and Regional Development Options



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6. THE URBAN AND REGIONAL DEVELOPMENT OPTIONS

6.1 Introduction

6.1.1 This chapter provides a background to the development, and details of, the railway network development options.

6.2 Key Main Study Assumptions

6.2.1 Prior to presenting details of the railway development options it is considered necessary to provide brief details on the key assumptions and forecasts that were used by the main study team during the development of the options.

6.2.2 The demand for new railways is closely linked to future planning, economic and infrastructure development both within the HKSAR and across the Boundary in neighbouring areas of the Mainland. Therefore the forecasts and assumptions adopted for future development have a direct influence on future railway development, including:

- future levels and distribution of population and employment;
- forecast rates of economic growth;
- forecast car fleet size, goods vehicle trips and port development;
- future development of the rail network and levels of service;
- future development of the highway network and bus services; and
- fares on the rail system and other public transport modes.

Land Use

6.2.3 For a long-term planning study such as RDS-2 it is inevitable that the planning and economic context will change during its course. In particular, there have been revisions to the planning data as the findings of Sub-Regional and other studies have been made available and as opinion has swayed against harbour reclamation. Also, the interim findings and assumptions from the parallel CTS-3 study have been made available throughout and progressively reflected in the RDS-2 assumptions.

6.2.4 The range of potential total development in the HKSAR was set by the three scenarios prepared by Planning Department in May 1998. The scenarios, from the Territory Population and Employment Data Matrices (TPEDM), are labelled S1, S2 and S3 and have total populations of 8.2, 8.9 and 10.1 million respectively for 2016.

6.2.5 Much of the future growth in population is located in Tseung Kwan O, the North East and North West New Territories and North Lantau. Employment is forecast to remain focused on Hong Kong Island and Kowloon. Thus the principal feature of commuter flows within the HKSAR will be to and from the existing urban area. The broad distribution of population and employment in each scenario is Table 6.1.

Table 6.1 Summary of SAR Population and Employment Forecasts (thousands)

Scenario	S1		S2		S3	
	Population	Employment	Population	Employment	Population	Employment
1996	6,207	2,980	-	-	-	-
2006	7,358	3,612	7,736	3,889	-	-
2011	7,774	3,746	8,338	4,171	-	-
2016	8,184	3,789	8,934	4,372	10,130	5,238

Source: Planning Department, May 1998.

- 6.2.6 In the course of the study, the S2 datasets were updated to incorporate planning changes such as reduced harbour reclamation and development of the Strategic Growth Areas (SGAs) in the NWNT, at Hung Shui Kiu, Au Tau and Kam Tin, and the NENT, at Kwu Tung, Fanling and Sheung Shui North. A number of alternative land use distributions were also examined including more intensive development of SGAs in the northern New Territories by 2016.
- 6.2.7 Based on official Mainland planning forecasts, the population of the Pearl River Delta (PRD) region is forecast to increase from a current level of about 30 millions to over 40 millions by 2016, and neighbouring Shenzhen to expand to nearly 5 millions.

Economic Growth

- 6.2.8 Economic growth influences a number of aspects of transport demand including vehicle ownership, propensity to travel through income levels, and modal choice through value of time. GDP assumptions have altered in the course of the study as revisions have been made to take account of the recent economic climate. Based on the most recent assumptions from CTS-3 average economic growth rates of 4-5% per annum have been assumed over the 20-year planning period. These growth rates take account of recent trends, particularly negative growth (recession) during 1998. Based on official Mainland projections, higher growth rates have been assumed for the PRD, in the range 5-10% per annum.
- 6.2.9 CTS-3 has developed a range of car fleet sizes, from the extreme of a "low" scenario which is in balance with the planned infrastructure, to a "high" scenario where there is no additional ownership restraint. RDS-2 has adopted the latest CTS-3 "medium" scenario of 618,000 cars as its central assumption.

Transport Network

- 6.2.10 The existing and committed railway network was used as a "Base" against which the future railway development network options were assessed.
- 6.2.11 The major highway network assumptions are consistent with those adopted in the CTS-3 study, reflecting the CTS-3's medium case highway recommendations available in mid-1998. The major new strategic routes are have been assumed are summarised in Table 6.2.

Table 6.2 Strategic Highway Network Assumptions

Year	Major Highway Schemes
By 2006	Route 7: Aberdeen to Sandy Bay Central Kowloon Route Tsing Yi North Coastal Road Tuen Mun Foothills Bypass Route 9: West Kowloon-Shatin Route 9: Lantau Fixed Crossing to West Kowloon Expressway Shatin Northern Bypass Shenzhen Western Corridor
By 2011	Central and Wanchai Bypass Island Western Corridor Route 7: Sandy Bay to Kennedy Town Tseung Kwan O Western Coast Road Route 10 Northern Section: Lantau to Yuen Long Highway Route 10 Southern Section: Hong Kong to Lantau Road P1 on North Lantau (Tung Chung to Yam O) Tuen Mun Port Expressway Tuen Mun Southern Bypass Lingdingyang Bridge
By 2016	Fourth Harbour Crossing (South East Kowloon to Causeway Bay) Eastern Highway: Fanling to South East Kowloon East-West Link (Yuen Long Highway to Tai Po) Tuen Mun Western Bypass Tuen Mun to Chek Lap Kok Link

6.2.12 Toll rates for existing and future highways and toll growth assumptions were also based on CTS-3 which assumed that tolls increase annually in line with inflation, i.e. no real increase in toll rates.

6.2.13 Future bus routes were added to the existing route network to serve population growth areas, new highway schemes and new railway stations. Other non-rail public transport services were assumed to remain largely unchanged.

6.3 Components of the Network Expansion Plans

6.3.1 The objective of RDS-2 was to determine a recommended railway network expansion plan which provided a framework for railway development by identifying the preferred schemes, their priorities and the preliminary route alignments. To achieve this, RDS-2 took into account the broad social, economic, planning and environmental goals and objectives for the HKSAR in the short-listing of possible railway schemes. This was followed by a comprehensive evaluation process before arriving at a list of preferred railway expansion schemes.

6.3.2 As a result of the various Top Down and Bottom Up studies, a set of schemes has been defined that are designed to fulfil the study goals and objectives. The key schemes form the building-blocks of the subsequent network expansion plans. The schemes include the following:

- North Island Line (NIL)
- East Kowloon Line (EKL)
- Tai Wai - Diamond Hill Link (TDL)

- Kowloon Southern Loop (KSL)
- Fourth Harbour Crossing (FHC)
- Northern Links (NOL)
- West Island Line (WIL)
- Regional Express Line (REL)
- Mass Transportation Centre (MTC)
- Port Rail Line/Port Rail Terminal (PRL/PRT)

6.3.3 Each of the schemes is briefly described below:

North Island Line (NIL)

6.3.4 The NIL "Swap" scheme will link the Tung Chung Line (TCL) via the Central and Wanchai reclamation areas through to the eastern section of the Island Line (ISL) at Fortress Hill (FOH). The Tseung Kwan O Line (TKOL) will then be extended from North Point to connect into the ISL at Tin Hau and run through to the western terminus at Sheung Wan (SHW). This scheme has a high priority for implementation as it relieves the ISL and TWL and promotes the use of the TCL, WR and TKOL. It is common to all railway network expansion options and its implementation needs to be co-ordinated with reclamation and infrastructure development along the north foreshore of Hong Kong Island.

East Kowloon Line (EKL)

6.3.5 The EKL will be formed by a line running from Diamond Hill to Hung Hom and presents the opportunity for integrated landuse/railway development at Kai Tak and will trigger urban renewal and bring environmental improvements in the Ma Tau Wai/Hung Hom area. Its timing and design should be fully integrated with development at Kai Tak to ensure rail takes a leading role.

Tai Wai - Diamond Hill Link (TDL)

6.3.6 The TDL will be formed by a link between Diamond Hill (DIH) and Tai Wai (TAW) and is recommended to be interconnected as a through running line with the EKL. A 3-way interchange between ER, MOSL and EKL-TDL could be provided at TAW or alternatively the EKL-TDL could be interconnected with MOSL to offer a through-running service which is more convenient to passengers, avoids complex interchange construction at TAW and is less costly. The TDL will enhance the linkage of East Shatin and Ma On Shan to urban Kowloon and onwards to Hong Kong Island and improve connectivity of the MOSL with railways in urban Kowloon. This will promote MOSL ridership and reduce transfers between MOSL and ER and has the useful function of relieving the critical TAW-KOT link and TAW interchange on ER.

Kowloon Southern Loop (KSL)

6.3.7 The KSL extends WR from Nam Cheong (NAC) to Hung Hom, which will promote usage of WR and cross Kowloon rail travel and thereby support development in Lantau Island, NWNT, West and East Kowloon. Its timing is flexible; early implementation is very beneficial as it promotes overall rail usage and development; later implementation is possible as it is not an urgent capacity relief scheme.

Fourth Harbour Crossing (FHC)

- 6.3.8 A number of options exist for forming the FHC, however, these have been narrowed down to an extension of ER or the proposed EKL. The configuration of the FHC affects the overall railway network development plan and has been assessed as an integral part of the possible network expansion options rather than just as stand alone FHC scheme.

East Rail as the Fourth Harbour Crossing (ER-FHC)

- 6.3.9 The extension of ER as a FHC provides a complete north-south corridor from the Boundary (LOW and LMC) to Hong Kong Island, enhancing opportunities for development in the Northern New Territories and promoting Cross Boundary rail travel.
- 6.3.10 In association with ER as the FHC, a complete east-west railway across the HKSAR will also be developed by linking WR to the MOSL by the KSL, EKL and TDL schemes. This will form a new east-west route across Kowloon with strategic north-south interchanges at MEF, NAC, TST, HUH, DIH and TAW. The phasing of this project is flexible. Ideally it would be developed early as a complete package and implemented with the ER-FHC.

East Kowloon Line as the Fourth Harbour Crossing (EKL-FHC)

- 6.3.11 The alternative is to develop a new corridor from Ma On Shan via South East Kowloon to Hong Kong Island by linking MOSL, TDL and EKL-FHC. The option of through running MOSL-TDL-EKL as one line is more convenient for passengers, however, depending on the operator, an interchange between the EKL and MOSL may be required at TAW, via a 3-way interchange station at TAW.
- 6.3.12 The new line will support the planned redevelopment of Kai Tak and provide a direct rail link between existing and planned development areas in Ma On Shan, East Shatin, South East Kowloon and Ma Tau Wai/Hung Hom with Hong Kong Island. Together with the KSL it will provide convenient connections with Hong Kong Island and across Kowloon for ER and Cross Boundary passengers transferring at the Mass Transportation Centre at Hung Hom.
- 6.3.13 In conjunction with the EKL-FHC, the KSL would be extended to HUH to form a major interchange with ER and the EKL-FHC. The phasing is flexible; the line could be implemented as one package or the EKL-FHC could be constructed first, and then TDL and KSL implemented later.

Routeing of the Fourth Harbour Crossing on Hong Kong Island

- 6.3.14 Two main options have been assessed for the routeing of the FHC on Hong Kong Island.
- via stations at Exhibition and Admiralty (EXH/ADM); or
 - via stations at Victoria Park, Leighton Hill, Wanchai South and Hong Kong Park (VIP/HKP).

- 6.3.15 The route via EXH/ADM provides a direct link to the main central business District areas and convenient interchange with both the NIL and the ISL. The extension via VIP/HKP gives a less direct route to Central and Wanchai and less convenient interchange to the ISL but extends the coverage of the railway system and improves access to the corridor south of the existing ISL.
- 6.3.16 In both cases the lines can be extended to an additional station at Central West (CEW). This would further improve the penetration and hence attractiveness of the FHC.

Northern Links (NOL)

- 6.3.17 The NOL provides a link between the WR corridor and the ER corridor and with the Boundary crossing stations at Lok Ma Chau (LMC) and Lo Wu (LOW). The line could be operated by a number of alternative service patterns; a simple pair of shuttle services between Kam Sheung Road (KSR) and LMC/Kwu Tung (KTU) was assumed in RDS-2. The line links the North East and North West New Territories, opens up a new corridor for the Strategic Growth Areas (SGAs) now under study at San Tin and Ngau Tau Mei and promotes rail for Cross Boundary travel. The timing and priority of the NOL depend on the growth in Cross Boundary travel and programmes for the SGAs.

West Island Line (WIL)

- 6.3.18 The WIL is formed by an extension of the Island Line from the Sheung Wan terminus to Western District. The rail line will offer a much improved level of service over road transport; provide an interchange with road transport at Kennedy Town, help relieve road congestion and serve new development and redevelopment now under planning in West Hong Kong Island. The design and timing of the WIL are dependent on the planning of reclamation and redevelopment in Western District, but in principle early implementation would be beneficial in transport and environmental terms.

Regional Express Line (REL)

- 6.3.19 The Study supports the continued development of Through Train Services (TTS) by the introduction of high speed rolling stock and the step by step raising of service frequencies to meet market demands. However, whilst the Guangzhou East - Shenzhen section has been upgraded to provide for high speed services, the intensive domestic EMU services on ER restrict TTS to a 38 minute journey for the 34km between Lo Wu and Hong Hom.
- 6.3.20 In the short term it is recommended that additional passing sections on ER are introduced to enable TTS to overtake ER trains to improve journey times. In the longer term a new high speed Inter-City corridor, the REL, is proposed between the Boundary and the Mass Transportation Centre at HUH, largely in tunnel. This new line would potentially permit Through Train services to run at unrestricted speeds through the HKSAR giving a HUH to LOW journey time of less than 15 minutes and reducing the Hung Hom-Guangzhou East journey time to around 65-75 minutes. The corridor may also accommodate fast commuter services from the Northern New Territories and the Boundary regions, relieving ER and extending Hong Kong's commuter catchment and overall accessibility.

- 6.3.21 The scheme could be phased, initially from a new ER interchange station at Fanling South to Hung Hom, with the possibility of a later link to Lo Wu bypassing Sheung Shui and Fanling. Ultimately, in liaison with the Mainland authorities, Cross Boundary services could be further improved through development of a potentially high speed link by-passing Lo Wu and Shenzhen to connect into the Guang-Shen railway north of Shenzhen.

Mass Transportation Centre (MTC)

- 6.3.22 Hung Hom would become the MTC for the HKSAR with provision for the following lines and services:

- Inter-City - TTS and Long Distance Services (LDS)
- East Rail - Lo Wu/Lok Ma Chau
- Regional Express Line (REL)
- EKL
- FHC
- WR/KSL

- 6.3.23 The MTC is proposed at Hung Hom as it is the most central location for the HKSAR population and employment and will be the focus of a comprehensive network of railways and public transport and has good road access. In addition, construction of a Regional Express Line to the MTC at HUH is considered to be feasible and is proposed for the medium to longer term. The MTC will require a phased development programme co-ordinated with the implementation of EKL, KSL, FHC and REL.

Port Rail Line/Port Rail Terminal (PRL/PRT)

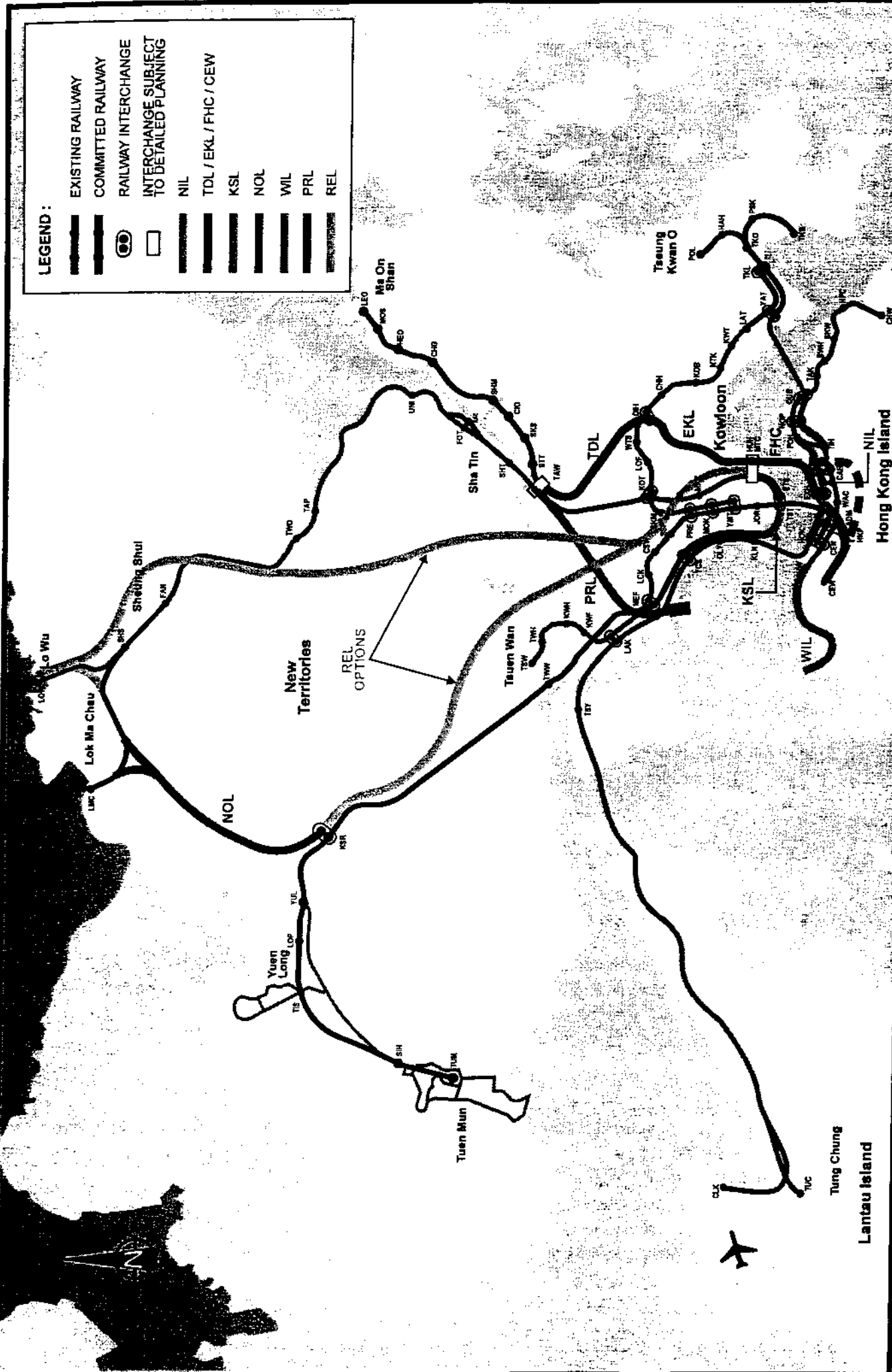
- 6.3.24 As discussed in the Final Report of the main study, it is recommended that the PRL/PRT Project is taken forward for detailed feasibility studies by KCRC in conjunction with Government.

6.4 Development of Network Options

- 6.4.1 The railway expansion schemes described above form the building blocks for future network development. Figure 6.1 shows the arrangement of the preferred network.
- 6.4.2 The final option chosen for the FHC will affect the interface with several other schemes and hence the configuration of the overall network. Therefore RDS-2 has categorised the schemes into two groups: those that will affect the network configuration, defined as the "Component Schemes"; and those that will not, defined as the "Stand Alone Schemes".
- 6.4.3 The Component Schemes, affecting the network configuration, are:
- North Island Line
 - East Kowloon Line
 - Kowloon Southern Loop
 - Tai Wai to Diamond Hill Link
 - Fourth Harbour Crossing

LEGEND :

- EXISTING RAILWAY
- COMMITTED RAILWAY
- RAILWAY INTERCHANGE
- INTERCHANGE SUBJECT TO DETAILED PLANNING
- NIL
- TDL / EKL / FHC / CEW
- KSL
- NOL
- WIL
- PRL
- REL



THE SECOND RAILWAY DEVELOPMENT STUDY
PREFERRED NETWORK



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Highways Department
Railway Development Office

6.4.4 The Stand Alone Schemes, that will not affect the network configuration, include two domestic passenger lines:

- Northern Links
- West Island Line

and the two Cross Boundary related schemes:

- Regional Express Line
- Port Rail Line

6.4.5 RDS-2 has assembled the Component Schemes into two basic network expansion options. They were developed around the two main choices for the FHC and reflect different emphases. Each of these leads to a different emphasis in the overall railway network development. To reflect these differences in emphasis, the Component Schemes were assembled into two groups of options:

- Options with a Regional Emphasis
- Options with an Urban Emphasis

Options with a Regional Emphasis

6.4.6 Cross Boundary travel is growing at unprecedented rates, for commuting and daily social/recreational purposes as well as the traditional business and family visits. At the same time, land use and activities either side of the Boundary continue to develop and change as socio-economic integration continues. The Regional options anticipate these trends and identify the need to build a framework for development in the region as a whole. These options are built around the extension of the KCR ER as the FHC and give emphasis to:

- developing a sustainable railway system for the region as a whole;
- promoting socio-economic integration of Hong Kong and Mainland, and provide high quality rail links between the key centres in Hong Kong, Shenzhen and the PRD;
- promoting accessibility to employment opportunities on both sides of the Boundary and throughout the HKSAR;
- developing rail corridors through the HKSAR to link the major development areas and minimise the need for road travel; and
- developing the Northern New Territories and Boundary Areas and promoting new areas for housing both sides of the Boundary.

6.4.7 The principal building blocks of the Regional options comprise the enhancement and extension of the North-South railway corridors, initially ER, but subsequently followed by WR.

6.4.8 It is envisaged that ER will be initially extended across the harbour to Central either via EXH and ADM or via VIP and HKP providing an interchange with the NIL and ISL. This will provide a direct route between Hong Kong Island and the Boundary at Lo Wu and Lok Ma Chau.

- 6.4.9 The TDL will be an extension of the MOSL to DIH to improve links to Kowloon and to relieve ER of heavy interchange demands at TAW. This will release further rail capacity for New Territories development and Cross Boundary traffic growth.
- 6.4.10 In the Metropolitan Area, further rail developments would be needed to serve new development areas, trigger urban renewal, and relieve parallel corridors.
- 6.4.11 The NIL is required in the Regional options to ensure passengers can be distributed efficiently in the Metro area and to prevent overloading on the ISL. By extending the penetration of the TCL and TKOL, the NIL also has a regional role in improving rail access to the SWNT and SENT.
- 6.4.12 The East Kowloon Line (EKL) will be formed by an extension of the MOSL (via the TDL) from DIH to HUH and ETS. The overall railway would need to be 6 car capacity to meet forecast demands. Interchange to ER at HUH would be provided for Cross Harbour travel.
- 6.4.13 Phase I West Rail terminates at Nam Cheong Street (NAC). This will be extended as the Kowloon Southern Loop (KSL) to ETS to connect with the EKL and form a strategic east-west route across Kowloon. This could have a number of configurations.
- through running between WR-KSL-EKL-TDL-MOSL requiring EKL-MOSL to be WR 9-car compatible design.
 - terminate WR and EKL at West Kowloon for interchange.
 - terminate WR and EKL at Hung Hom for interchange.
 - terminate WR at KTA, DIH or TAW requiring EKL to be WR 9 car compatible but enabling MOSL to remain 4-car.
- 6.4.14 From a passenger viewpoint, through running is favoured, and has been assumed for assessment purposes in order to maximise passenger benefits.

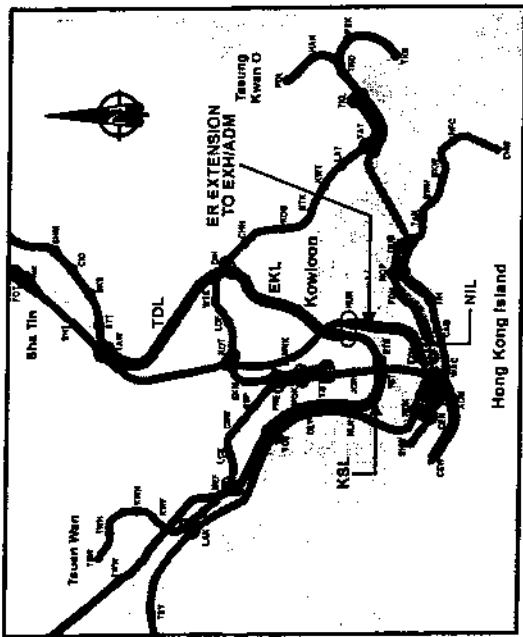
Option with an Urban Emphasis

- 6.4.15 The Metropolitan Area (Metro) is the core area of economic activity in the HKSAR, home to some 4 million and workplace for 2.4 million people. Many of Metro areas are in need of urban renewal and other areas, such as Kai Tak, are earmarked for major housing development.
- 6.4.16 The Metro Area acts as an employment centre for the residents of New Towns in the New Territories and so it is essential that fast and efficient travel links are developed to distribute people into these downtown areas.
- 6.4.17 The Urban options are focused on serving the Metropolitan Area. They are built around the extension of the EKL as the FHC and give emphasis to:
- developing an extensive urban railway system in Metro;
 - key interchange nodes with railway and public transport corridors serving the New Territories and Cross Boundary;
 - providing urban rail links to all major development areas in Metro;

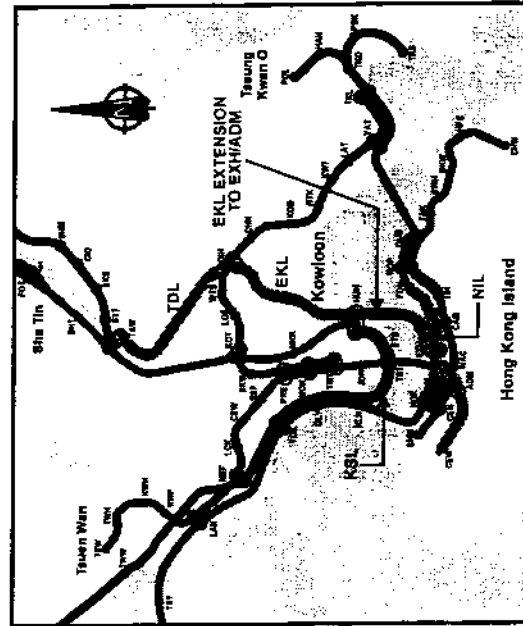
- promoting use of rail to trigger urban renewal;
 - minimisation of road-based travel in Metro; and
 - promoting integrated rail/pedestrian network systems within Metro.
- 6.4.18 The key components of the Urban options comprise improved accessibility to the Hong Kong Island corridor and South East Kowloon.
- 6.4.19 The NIL Swap scheme forms the initial component of the Urban options. The EKL forms a new railway corridor in Metro running from DIH through HUH and across the harbour to either EXH/ADM or VIP/HKP thereby serving new development at South East Kowloon, facilitating redevelopment in Central Kowloon, providing a fourth harbour crossing with easy interchange to East Rail at HUH, and linking into NIL and ISL.
- 6.4.20 The EKL will be extended to TAW to relieve ER and provide interchange links with ER at TAW thereby providing a new corridor from NENT through the eastern part of Metro.
- 6.4.21 West Rail will be extended from NAC via West Kowloon to Hung Hom to form the KSL and provide cross Kowloon linkages and add capacity in the West Kowloon/West Rail Corridor. The WR and ER services could:
- both terminate at HUH enabling each service to be tailored to match demands in their respective corridors, and ER to continue with 12 car train services; or
 - following conversion of ER trains and operating systems to WR standards, WR and ER train services could be interconnected and offer through running.
- 6.4.22 Completion of these schemes will provide a comprehensive urban railway network in the Metro area and will enable external rail and bus services to interchange at key stations.

Summary of Network Options

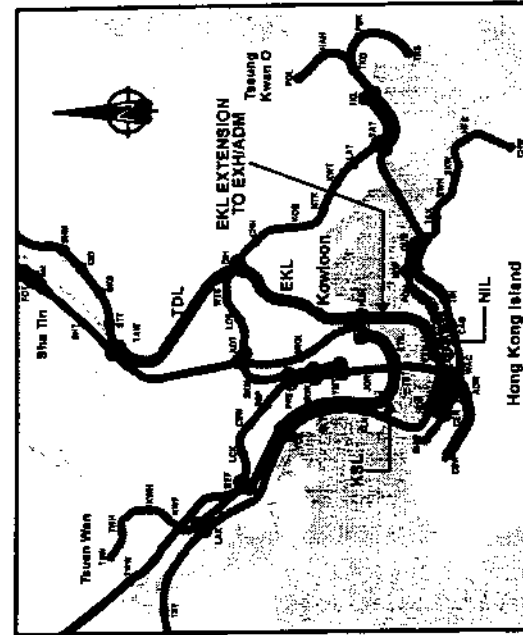
- 6.4.23 The ultimate networks in the Regional and Urban options are the same but differ in their configuration and phasing.
- 6.4.24 It should be noted that both groups of options support both regional and metropolitan development because the only difference between the two groups in this respect is the network configuration and interchange arrangements at Hung Hom. Under the Regional options, passengers from South East Kowloon can change to ER at HUH to reach Hong Kong Island. Similarly for the Urban options, passengers from the New Territories and Shenzhen can change to the EKL at HUH to reach Hong Kong Island.
- 6.4.25 Since under both network options, the FHC could route via either EXH/ADM or VIP/HKP on Hong Kong Island, and the EKL/FHC under the Urban Network could be implemented by MTRC or KCRC. These alternatives result in a total of six network expansion options which are shown graphically in Figure 6.2, and summarised in Table 6.3 below.



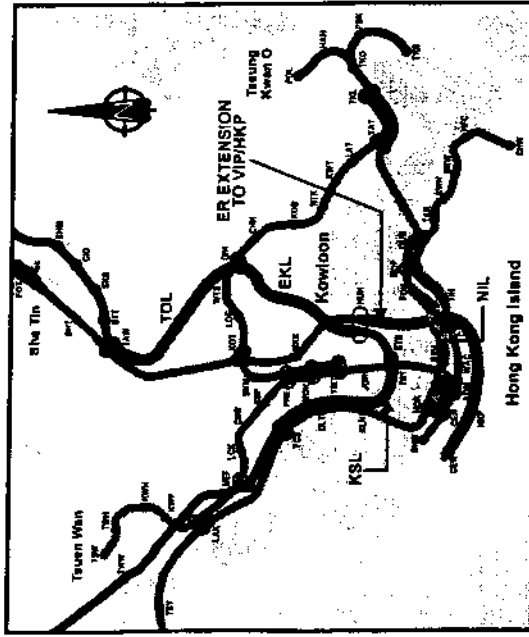
Regional - EX/HiADM



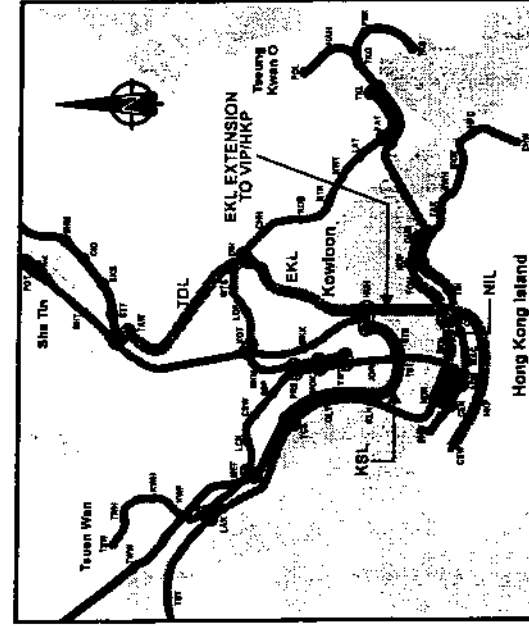
Urban - MTR - EX/HiADM



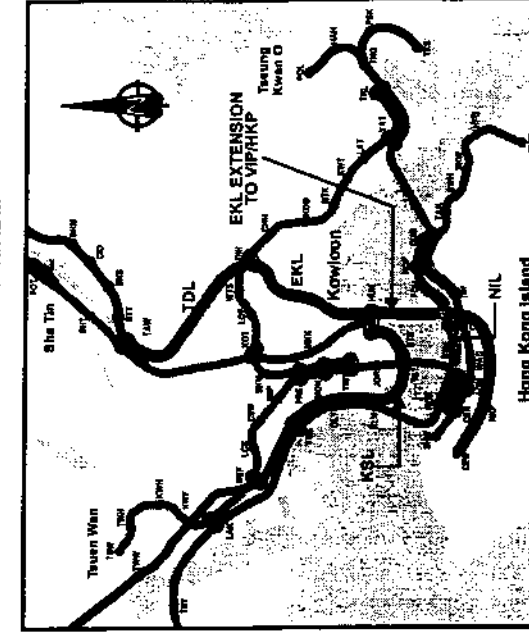
Urban - KCR - EX/HiADM



Regional - VIP/HiKP



Urban - MTR - VIP/HiKP



Urban - KCR - VIP/HiKP

- LEGEND :
- EXISTING RAILWAY
 - COMMITTED RAILWAY
 - RAILWAY INTERCHANGE
 - KCR SCHEMES
 - MTR SCHEMES



THE SECOND RAILWAY DEVELOPMENT STUDY
NETWORK OPTIONS - COMPONENT SCHEMES

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Table 6.3 Network Options

Emphasis	Operator of EKL	Routeing on HK Island
Regional	KCR	EXH/ADM VIP/HKP
Urban	MTR	EXH/ADM VIP/HKP
Urban	KCR	EXH/ADM VIP/HKP

6.5 Long Term Strategic Schemes

6.5.1 In addition to the Component Schemes and Stand Alone Schemes, a number of other potential rail development options were investigated but found to be lower priority; predominantly because they relied either on longer term developments, the outcome of future planning decisions or they were predicted to be needed for the long-term relief for sections of the future rail network. Due to their long-term nature, these schemes have, in general, only been identified as possible corridors for further network expansion, although in some cases (notably the SIL) indicative alignments have been identified. Figure 6.3 shows the broad corridors of the Longer Term Schemes.

6.5.2 The Longer Term Schemes are briefly described in the following paragraphs.

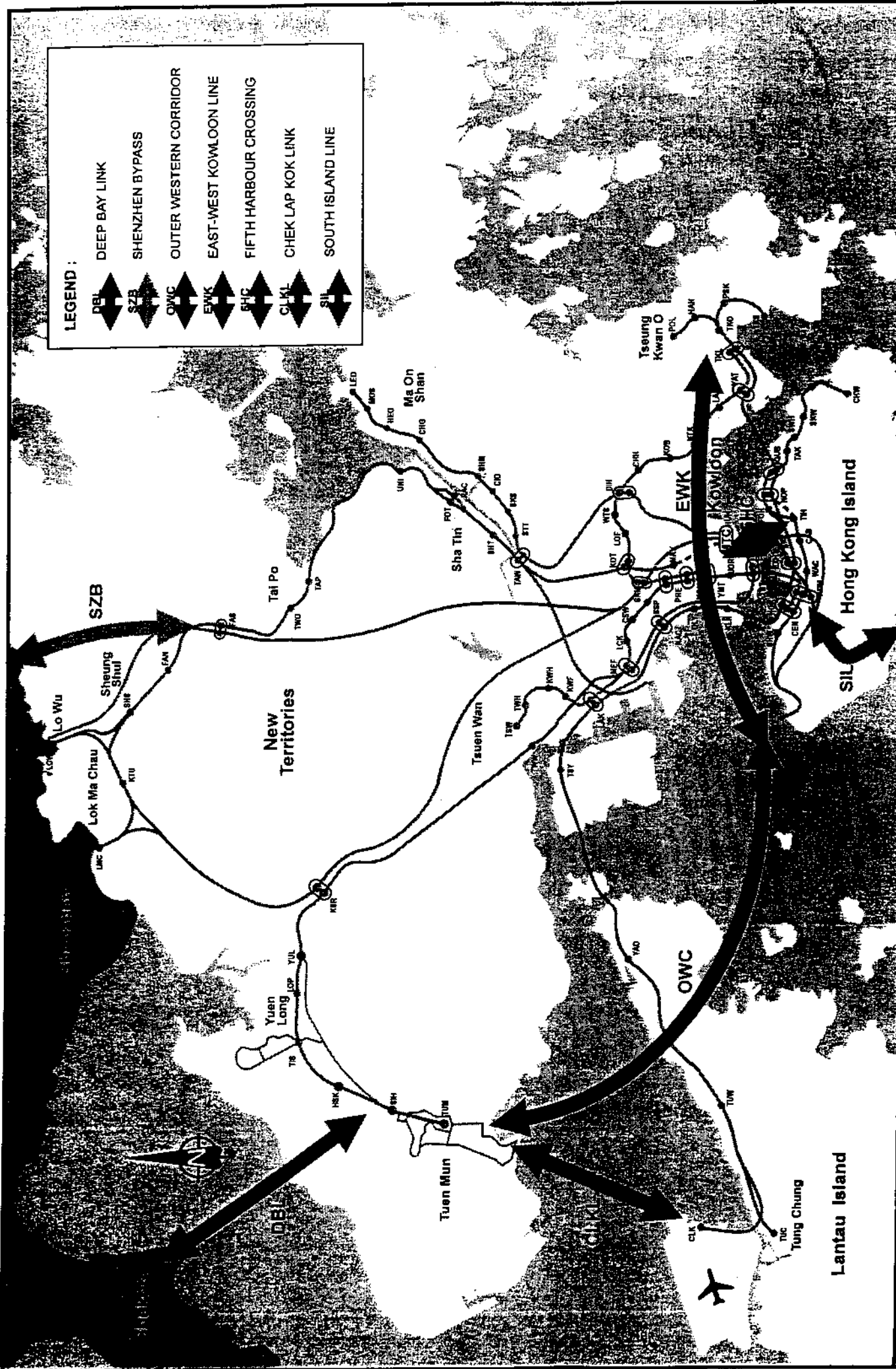
South Island Line (SIL)

6.5.3 This scheme would provide a link between northshore Hong Kong Island and the areas on the south side of the Island including Wah Fu (WAF), Ap Lei Chau (ALC) and possible reclamation areas located to the south of the present Ap Lei Chau. Aberdeen may also be served under certain configurations, although its population may be too small to warrant a station.

6.5.4 Whilst a number of configurations are possible, including extensions of the FHC, it is likely that the most efficient would be a shuttle service terminating either at SHW or ADM. However, the likely modest demands cannot justify a mass carrier.

East West Kowloon Line (EWK)

6.5.5 This corridor was carried forward from the initial comprehensive network. The alignment of and demand for such a link is entirely dependent on the outcome of additional study of South East Kowloon, though it may have a useful role in relieving existing lines serving East Kowloon and Tseung Kwan O. One possible option for the western end of the line is for it to extend beyond West Kowloon to form a linkage with Green Island and a possible OWC.



LEGEND :

- DBL DEEP BAY LINK
- SZB SHENZHEN BYPASS
- OWC OUTER WESTERN CORRIDOR
- EWK EAST-WEST KOWLOON LINE
- FHC FIFTH HARBOUR CROSSING
- CLKL CHEK LAP KOK LINK
- SIL SOUTH ISLAND LINE

THE SECOND RAILWAY DEVELOPMENT STUDY
LONG-TERM POSSIBILITIES



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Fifth Harbour Crossing (5HC)

- 6.5.6 The FHC options focus on the alternatives between EXH/ADM and VIP, and it is anticipated, based on current planning and policy assumptions, that a total of four harbour crossings will be sufficient until beyond 2016. However, one possibility is for both FHC options to be constructed to provide a total of five crossings. This could allow objectives such as opening up development potential in the VIP area (and beyond) to be realised whilst also providing a direct connection from HUH to the heart of the existing Central Business District via the EXH/ADM alignment. The need for a fifth harbour crossing may also become more urgent under policy scenarios such as deferment or reduction of the highways development programme, restriction of bus competition or traffic restraint.

Outer Western Corridor (OWC)

- 6.5.7 The originally identified OWC alignments are likely to change in the light of uncertainty over the extent of the Green Island Development, the committed theme park developments on northshore Lantau and the need to have a significant additional population catchment on Lantau or in the NWNT to make the OWC attractive. Future studies of the alignment could be further west, and possibly incorporate the Tuen Mun to Chek Lap Kok link. There would however need to be substantial additional development on Lantau, over and above current planning horizons, in order to justify any form of OWC.

Deep Bay Link (DBL) and Shenzhen Bypass (SZB)

- 6.5.8 These schemes are associated with providing additional Cross Boundary capacity. The Deep Bay Link is a possible extension of the OWC (or can be a stand-alone scheme) to Shekou whilst the Shenzhen Bypass is an extension/alternative alignment of the REL to the Lin Ma Hang boundary crossing. Both are dependent on Cross Boundary network development and are discussed in further detail in the following chapter.
- 6.5.9 Due to their longer term nature, and therefore the relatively 'undeveloped' nature of the above schemes, it was not the intention to undertake strategic environmental assessments of these potential rail development options since they should be subject to changes resulting from the outcome of key influencing decisions. However, certain schemes, such as the SIL were carried forward to the Scheme Assessment Stage of the RDS-2 Study and, only after the results of these assessments were known were they down-graded to Longer Term Schemes. Consequently, these schemes were addressed to a level of detail commensurate with the Component and Stand Alone Schemes by the SEA Team. The findings of the strategic environmental implications of the SIL are presented in Section 7.

Timing of Rail Development options

- 6.5.10 The implementation programme for the railway expansion schemes showing the indicative timing of the schemes is summarised in Table 6.4.

Table 6.4 Implementation Programme

Scheme	Opening	Rationale	Operator
NIL	2008-2011	Needed to relieve TWL and ISL following opening of committed rail lines.	MTRC
FHC	2008-2011	Needed to provide additional cross harbour rail capacity.	MTRC/KCRC
EKL	2008-2011	Needed to serve redevelopment of Kai Tak and South East Kowloon.	MTRC/KCRC
TDL	2008-2011	Needed to relieve ER but could be deferred with earlier conversion of ER to ATO and associated higher service frequencies.	MTRC/KCRC
CEW	2011-2016	Not essential but improves penetration of FHC and relieves interchange with ISL.	MTRC/KCRC
KSL	2011-2016	Improves accessibility to ER and WR and east-west connectivity across Kowloon. Priority could be raised and implementation advanced to boost WR revenue.	KCRC
NOL	2011-2016	Links NENT and NWNT. Serves potential second generation SCAs at Ngau Tam Mei, San Tin and Au Tau. Improves accessibility to Boundary from Western NT.	KCRC
WIL	2011-2016	Supports redevelopment and planned additional employment in Western District. Provides road/rail interchange for West HK Island.	MTRC
REL	Flexible	Relieves ER, enhances Inter-City services and improves access to Northern NT.	Open
PRL/PRT	Flexible	Extends hinterland of Hong Kong container port deeper into Mainland China. Early completion for market positioning and viability.	KCRC

6.6 Network Usage

6.6.1 In addition to the SEA component of the Study, the proposed rail development options were assessed using a broad multi-disciplinary evaluation which included transport, planning, property, engineering and cost considerations. The results of this are described in the main study report.

6.6.2 The growth in usage of the railway system and rail market share are summarised in Table 6.5.

Table 6.5 Rail System Usage and Market Share

	Rail Boardings ⁽¹⁾		Rail Passenger Kilometres ⁽²⁾	
	Daily (millions)	Percent of Total PT%	Daily (millions)	Percent of Total PT%
1998 Existing	3.73	31%	24.16	34%
2006 Committed	5.90	39%	57.72	49%
2016 Expanded Network ⁽³⁾	8.3	44%	95-96	58%-59%

- Notes : (1) Calculations based on CTS-3 definition i.e.
Rail includes MTR, KCR, LRT, HK Tram and Peak Tram.
PT includes the above plus Bus, PLB, Ferry, SPB and Taxi.
- (2) Percent of PT Travel by Rail based on:
Rail includes MTR and KCR.
PT includes the above plus Bus, PLB and Ferry.
- (3) Component Schemes plus WIL and NOL.

Total Rail Ridership

- 6.6.3 Total rail ridership is forecast to increase from 3.7 million daily boardings in 1998 to nearly 6.0 million daily boardings in 2006 with the addition of the committed railway schemes. Implementation of the expanded railway network options by 2016 is forecast to increase rail ridership to over 8.0 million daily boardings.
- 6.6.4 A comparison of the Network Options for the Component Schemes is given in Table 6.6 which shows there is very little difference between the total rail ridership of the different options.

Table 6.6 Comparison of System Usage of the Network Options for Component Schemes

2016 Component Schemes	Regional		Urban - MTR		Urban - KCR	
	EXH/ ADM	VIP/ HKP	EXH/ ADM	VIP/ HKP	EXH/ ADM	VIP/ HKP
Rail Boardings (millions, daily)	7.88	7.89	7.75	7.75	7.82	7.84
Total Rail Passenger Kilometres (millions, daily)	93.18	93.52	89.91	89.65	91.58	92.25

- Notes : (1) Calculations based on CTS-3 definition i.e.
Rail includes MTR, KCR, LRT, HK Tram and Peak Tram.
PT includes the above plus Bus, PLB, Ferry, SPB and Taxi.
- (2) Component Schemes only (excluding WIL and NOL).